

# NAFAs møde med Venus i 2004 og 2012

## MEETING VENUS

A Collection of Papers Presented at the  
Venus Transit Conference in Tromsø 2012



Christiaan Sterken and Per Pippin Aspaas (eds.)

## **On 2-3 June 2012, the University of Tromsø hosted a conference about the cultural and scientific history of the transits of Venus.**

The conference took place in Tromsø for two very specific reasons. First and foremost, the last transit of Venus of this century lent itself to be observed on the disc of the Midnight Sun in this part of Europe during the night of 5 to 6 June 2012. Second, several Venus transit expeditions in this region were central in the global enterprise of measuring the scale of the solar system in the eighteenth century.

The site of the conference was the Nordnorsk Vitensenter (Science Centre of Northern Norway), which is located at the campus of the University of Tromsø. After the conference, participants were invited to either stay in Tromsø until the midnight of 5-6 June, or take part in a Venus transit voyage in Finnmark, during which the historical sites Vardø, Hammerfest, and the North Cape were to be visited. The post-conference program culminated with the participants observing the transit of Venus in or near Tromsø, Vardø and even from a plane near Alta.

These Proceedings contain a selection of the lectures delivered on 2-3 June 2012, and also a narrative description of the transit viewing from Tromsø, Vardø and Alta. The title of the book, *Meeting Venus*, refers the title of a play by the Hungarian film director, screenwriter and opera director Istvan Szabo (1938-). The autobiographical movie *Meeting Venus* (1991) directed by him is based on his experience directing *Tannhäuser* at the Paris Opera in 1984. The movie brings the story of an imaginary international opera company that encounters a never ending series of difficulties and pitfalls that symbolize the challenges of any multicultural and international endeavor. As is evident from the many papers presented in this book, *Meeting Venus* not only contains the epic tales of the transits of the seventeenth, eighteenth and nineteenth centuries, it also covers the conference participants' encounter with "Venus on the Sun" in historical archives as well as face-to-face at several locations in the Troms and Finnmark counties.

# Tre medlemmer fra NAFA

trodsede

**flyselskabers konkurs**

**bilsammenbrud**

**og høje ølpriser**

**og så hele Venus- passagen den 6. juni 2012 på midnatssolens skive**

**Venus in Sole Visa**

(Venus set i Solen)

**Deltagerne i Venus - konferencen i Tromsø juni 2012**



Hans E. Jørgensen, NAFA, ses til højre for den høje mand med rødt slips i bagerste række.

Per Rieffestahl, NAFA, knælende midt i forreste række.

Steinar Thorvaldsen, medarrangør, til højre for Per Rieffestahl.

Hans Peter Kristensen, NAFA, er ikke med på dette billede.

Per Rieffestahl:

Konferencen var indledningen til en masse aktiviteter i forbindelse med Venus-passagen den 6. juni 2012.

Jeg har skrevet om begivenheden i to avisartikler. Disse findes på NAFAs hjemmeside under "Nordjyske" i rubrikken "Artikler".

Men den er også behandlet - mere officielt - i en artikel af Steinar Thorvaldsen fra Tromsø Universitet.

Denne kan man - med hans tilladelse - læse her.

Artiklen er en del af en nys udkommet bog med videnskabelige indlæg fra konferencen i 2012. På en af de sidste sider kan man se Hans E. Jørgensens og Per Rieffestahls kontakttider (Table 1).

Hans E. Jørgensen filmede desuden en stor del af Venus-passagen.

I Aalborg var man ligesom i Tromsø aktiv i 2012. Der var dog ikke tale om koordination af aktiviteterne de to steder.

I 2004 var NAFA også aktiv i forbindelse med en Venus-passage.

Om observationerne dengang kan man læse på NAFAs hjemmeside under "Venuspassagen 2004" i rubrikken "Artikler".

Bidragydere er her Svend Petersen, Ole Fastrup, Per Rieffestahl, Jesper Thorup Nielsen og Holger Nielsen.

I 2004 blev der også observeret, filmet, fotograferet og taget kontakttider både i Aalborg og Vildmosen.

### **Kontakttider 8. juni 2004**

	Cartes du Ciel (oplysninger fra Hans E. Jørgensen)	Per Rieffestahl (visuelt)	Hans E. Jørgensen (oplysninger fra Hans E. Jørgensen)
1	05:19:13 UT	05:20:11,16 UT	05:19:30 UT
2	05:39:25 UT	05:37:57,63 UT	05:39:16 UT
3	11:03:10 UT	11.03:24,39 UT	11.03:21 UT
4	11:22:30 UT	overskyet	11:22:45 UT

## Kontakttider 6. juni 2012 (oplysninger fra Steinar Thorvaldsens artikel)

Contact	Calculated	Visually	Visually	On video
		Per Rieffestahl	Hans E. Jørgensen	Hans E. Jørgensen
	Cartes du Ciel	telescope	on screen	
1	0:04:30	?	0:05:00 (?)	-
2	0:22:16	0:20:07 (?)	0:21:53	-
3	6:36:02	6:35:43	6:35:49	6:36:07
4	6:53:39	6:53:17	6:53:30	6:53:40

Fantastisk, at vi i NAFA har oplevet to Venuspassager - og har film/fotos og kontakttider fra begge!

Selvfølgelig også en masse fotos og videoer af blandt andre Jesper Thorup Nielsen, samt spændende visuelle observationer og beskrivelser.

Holger Nielsen skriver i sin beretning fra 2004:

"Vi var tre eller fire personer, der så lysbuer: Først to korte buer, som strakte sig ud fra Solen fra hver sit Venus -"horn", og som kort efter blev forenet til en hel bue. For mig var det den mest betagende oplevelse under passagen: Direkte at se et tegn på, at Venus har en atmosfære."

Måske er der andre, der har haft lignende oplevelser i 2012?



Venuspassagen den 8.juni 2004 (3.kontakt)  
Foto:Hans E.Jørgensen

## Venus- passagen i Tromsø 2012

Beskrevet af en af arrangørerne af "Venus Transit Conference" i bogen "Meeting Venus" udgivet i september 2013.

# The Transit of Venus on the Midnight Sun Observed from the Tromsø Region

Steinar Thorvaldsen

## Abstract.

Tromsø, the largest city in Northern Norway, is almost 70 north, and, as luck would have it, a fantastic Midnight Sun shone down from the clear blue arctic sky during the entire night of the June 2012 transit. It was like a dream come true for astronomers in the area! The weather was perfect in most parts of the Tromsø region, and the Norwegian national TV channel, NRK, got the front row for its marathon broadcast that lasted for more than seven hours. Several groups observed the night-long transit that started just after midnight and ended after 7 a.m. One group took the cable car just outside Tromsø city to 420 m above sea level on Fløya mountain, while another group observed from the top of the Auroral Observatory by the lake Prestvannet on Tromsø Island. Both groups had telescopes and cameras to stream video and pictures to the internet and to national TV broadcasts.

## 1. At the Cable Car Station

The observers at the cable car station had reinforcements by David Wright from the Astronomy club in Oslo. They had an 80-mm telescope with video camera for streaming to the Internet, a 70-mm telescope of the type Ranger with camera dedicated to still photography, a telescope with regular sunscreen and, from Oslo, a Televue 101 with a 90-mm Coronado Solarmax H-alpha filter. Pål Tengesdal operated the 80-mm refractor with video for delivery of images to the Norwegian Science Centre's webcast and television companies. I operated the Ranger telescope. The group took the cable car up early in the evening to set up and test their equipment, and, not least, the food from the kitchen of the Cable Car restaurant. During the evening, several other groups and observers arrived. This included a school class from Germany, and individuals from Germany, as well as the Netherlands, Denmark, Spain and Brazil.



*Figure 1.*

Left : The big screen at the football field outside Tromsø Sports Hall. Photo: Øystein Lund.

Right : Map of three observing sites close to Tromsø city. Based on Google Earth.

A large group from the University of Madrid had also made the long trip to observe the event. Around midnight a lot of people showed up, primarily to see the Midnight Sun. Some of them were unaware of the upcoming transit and they were delighted to see the little black Venus on the solar disk at the same time. Figure 1 shows a map with the observing sites, and Fig. 2 shows the Cable Car observing site.

The large crowd went back down to Tromsø with the last cable car of the night at 3 a.m., after that fully dedicated observers were the only ones left to witness the transit. Although we had full access to facilities and heating in the cable car station and restaurant, the beautiful weather made the vast majority of us stay outside all night. After the passage was over, we had breakfast and watched the clouds roll back in while we waited for the first trip down at 10:30.



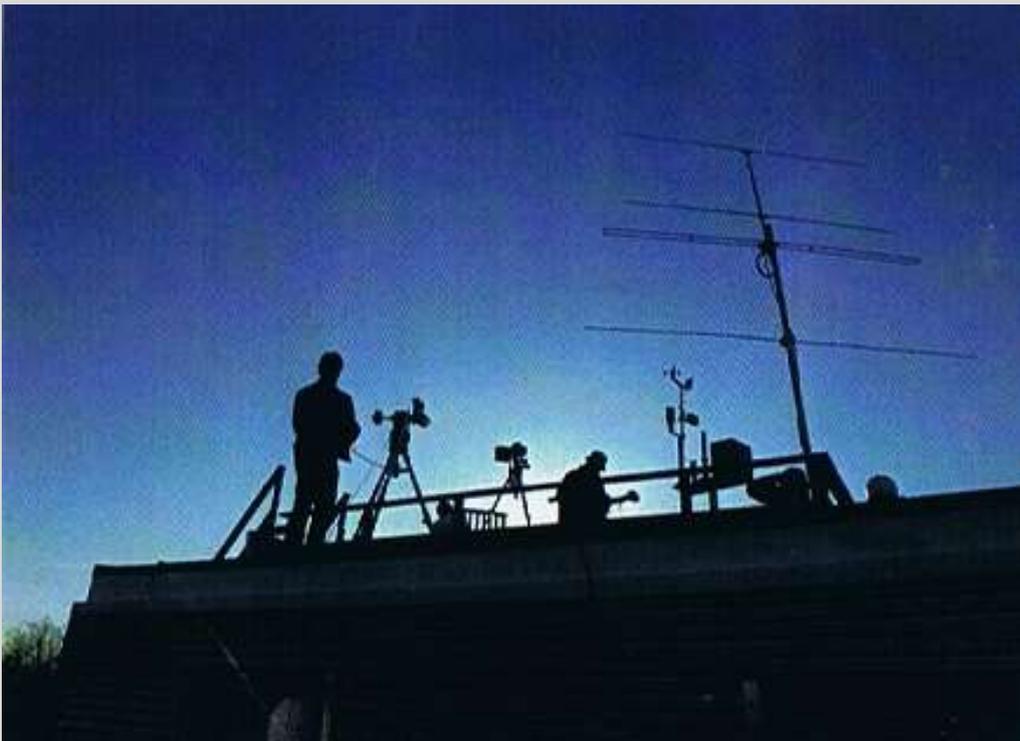
*Figure 2.*

Observers at the Cable Car Station in Tromsø.  
 From left to right:  
 David Wright, Anne Bruvold, Steinar Thorvaldsen and Pål Tengedal.  
 Photo: Anne-Kristin Tengedal.

## 2. At the Auroral Observatory

Some ten observers had chosen the observation roof of the Auroral (Northern Lights) Observatory at 89 meter above sea level as their observation site (Fig. 3). Among the observers were: Torsten Aslaksen with a 60-mm refractor and H<sub>α</sub> solar filter and video for delivery of images to the Norwegian Science Centre's webcast and to TV stations; Sven Erik Grydeland with a 250-mm Maksutov-Newtonian Skywatcher and camera; Stein Høydalsvik with a 110-mm William Optics refractor with camera and Anders Olsen with an 80-mm William Optics refractor, visually. There were also visitors from Scotland.

**Three amateur astronomers from Nordjysk astronomy club, NAFA, in Aalborg, Denmark had also made the trip to Tromsø, with Per Rieffestahl and Hans Kristensen observing visually, and Hans Ejler Jørgensen recording the transit observing the 2012 Venus Transit from Tromsø with a Phillips SPC 900NC PC camera through his Meade LX200 telescope and an f/3.3 focal reducer.**

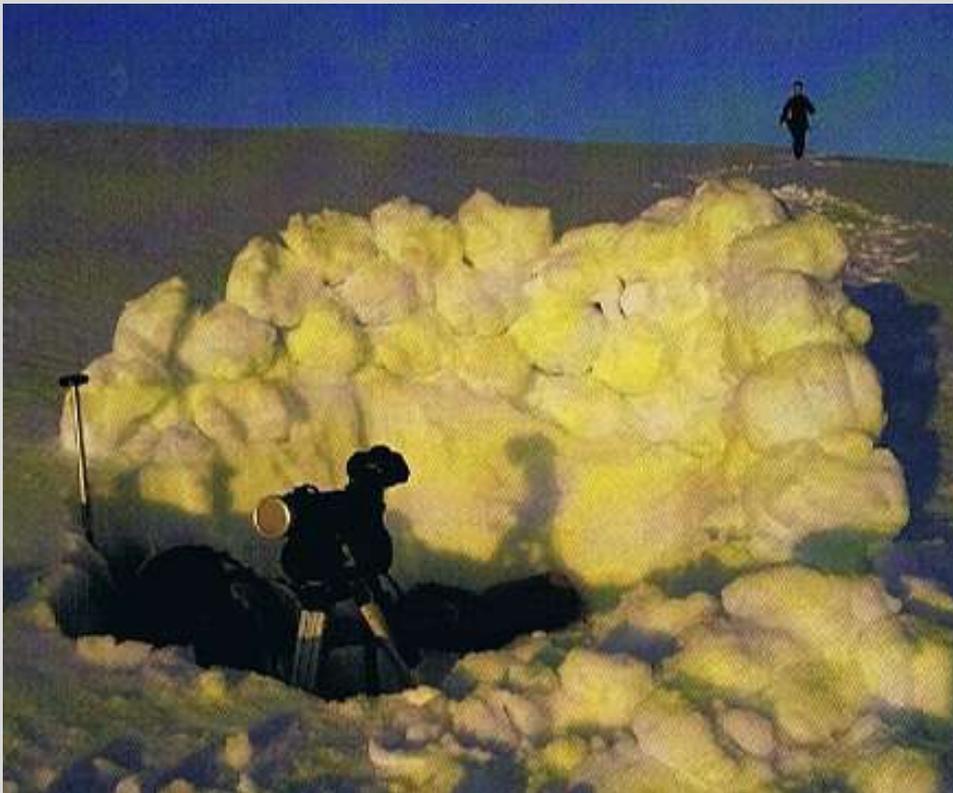


*Figure 3.*

Observers at the Auroral (Northern Lights) Observatory in Tromsø.  
Photo: Per Rieffestahl.

### 3. Mountain peaks

Northern Norway has many peaks that may be suitable for extreme trips to find the best atmospheric conditions. Erling Nordøy is one of the region's most enthusiastic astro-photographers. To achieve the best possible conditions, he took the trip on skis to the top of Vasstinden, 895 m above sea level on Kvaløya west of Tromsø city, with 20 kg of equipment on his back! Here he caught the entire transit under perfect conditions, with only slight turbulence in the beginning, and took a total of 24 GB of images in raw format through his Swarovski AT 80HD telescope (Fig. 4). This material has been processed, where around 20 images (taken during 56 seconds) are stacked, to optimize image quality and give a fantastic impression of the transit. Furthermore, Ole Anton Haugland and Åge Mellem made the trip up to Gumpe in Sørreisa, over 1000 m above sea level, with clear view in all directions.



*Figure 4.*

Erling Nordøy's snow observatory built at Vasstinden outside Tromsø, nearly 900 m above sea level.

#### 4. All-night National TV Show

The University of Tromsø, Norwegian TV and Knut Jørgen Røed Ødegaard plus several others had invited the public to a Venus transit show at the soccer field outside a Sports Hall on Tromsø Island. A crowd of around 1,000 people showed up, which was beyond most expectations. The area was equipped with a large video screen, many stands and an outdoor TV studio. In fact we could see the big screen with our telescopes from the Cable Car station several kilometers away. Around the football field it was possible to engage in various research activities organized by the University of Tromsø and others.

Figure 1



Ida Kvissel from the Norwegian national TV (NRK) was responsible for the live broadcast of the transit of Venus, and the program was led by Selda Ekiz and Per Olav Alvestad.

For Kvissel and the science staff at NRK this was the first time they had attempted such a long live broadcast, and it was impressive to keep it going throughout the arctic midsummer night. Although there were a couple of small hitches, they managed quite well thanks to visits by guests like the wellknown Norwegian astronomer Knut Jørgen Røed Ødegaard with his wife Anne Mette Sannes, and Truls Lynne Hansen from the University of Tromsø together with Pål Brekke from the Norwegian Space Centre.

According to the Norwegian Broadcasting Corporation, there was an average of 163,000 viewers who followed the program throughout the night, while 892,000 visited the program for at least one minute. In addition to all those that followed the transit on national TV, there were almost 50,000 people who followed it on NRK's live stream on the Internet. The TV images of the transited Sun were recorded by people of the Tromsø astronomy club, located at the Cable Car station and at the Auroral Observatory, and other sites around the country. The live pictures were also shown on the web of the Norwegian newspaper VG, and periodically also by NASA and other international sites. Particularly interesting were the simultaneous videos taken from Hawaii and Tromsø that made it possible to demonstrate the parallax phenomenon live. The Norwegian newspaper Dagbladet also followed the event the whole night via updated pictures displayed on their media sites.

## 5. The observations

The transit began with the first contact at 0:04:30 local time in Tromsø, and the second contact, at 0:22:16. But with the Sun in the north and at its lowest at 0:43 and just over two degrees above the horizon at its lowest, the turbulence made it impossible to clearly see the first contact. The second contact was also challenging, with Venus dancing on a crooked solar limb.



*Figure 5.*

Left :

The Sun with a black spot at 02:23 local time. A few thin clouds came in and displayed for some short periods Jupiter-like belts on the solar disc.

Camera: Canon EOS 450D with 70 mm Ranger telescope.

Right :

Transit of Venus at 05:14 local time.

Camera: Canon EOS 600D with 70 mm Ranger telescope.

Photos by Steinar Thorvaldsen.

But later on, it was easy to follow the motion of Venus with telescopes and with H- alpha filters and several sunspots could be observed. In particular, H- alpha filters made it possible to monitor the protuberances around the solar disc, and structures on the solar disc itself. A few thin clouds came in from the north and displayed for some short periods Jupiter-like belts on the solar disc, without disturbing the black silhouette of Venus (Fig. 5). The clouds just created nice variations in the scenery.

During the night the Sun climbed higher in the sky and seeing conditions improved, making the third and fourth contact much easier to observe. Some contact times are listed in Table 1. Observers using an H-alpha filter saw the fourth contact about a minute after the white-light observers saw it. This is because H-alpha telescopes show the solar chromosphere, which is above the photosphere. After fourth contact the

clouds came in from the north with full strength, and the well-known coastal rain started to fall later on: how incredibly lucky we had been!

*Table 1.*

**Contact times of the Venus 2012 transit as observed from Tromsø**  
(69\_3904100 N, 18\_5602600 E).

The observations are given in Central European Time (UT + 2 hours).

Observers: Per Rieffestahl (visual with telescope),  
Hans Jørgensen (visual on screen, and video).

Contact	Calculated Cartes du Ciel	Visually telescope	Visually on screen	On video
1	0:04:30	?	0:05:00 (?)	-
2	0:22:16	0:20:07 (?)	0:21:53	-
3	6:36:02	6:35:43	6:35:49	6:36:07
4	6:53:39	6:53:17	6:53:30	6:53:40

The transit of Venus event has been an undisputed success in the Tromsø area, and we felt as if we had been on another planet, with a strong taste of heaven, the whole night!

**Note added by the Editors**

Steinar Thorvaldsen, Dr. scient. in mathematics, associate professor at Tromsø University's Department of Education and long-serving head of Tromsø Astronomiforening (astronomy club), has for decades devoted himself to the task of organizing observations and disseminating astronomical knowledge to the public. With characteristic enthusiasm and diligence, Steinar not only organized the Venus transit observations as recounted in this paper, he also helped to secure funding both for the conference and for its Proceedings. Incidentally, the publication of these Proceedings coincides with his 60th birthday on May 31, 2013, on which we warmly congratulate him.

